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TRANSLATION

READJUSTABLE AUTOMATIC LINES FOR MODERNIZED MACHINES FOR
THE PRODUCTION OF TAPS

By

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FOREIGN TECHNOLOGY DIVISION



AIR FORCE SYSTEMS COMMAND

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READJUSTABLE AUTOMATIC LINES FOR MODERNIZED MACHINES
FOR THE PRODUCTION OF TAPS

BY: D. G. Yakovlev and O. E. Nudel'man

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READJUSTABLE AUTOMATIC LINES FOR MODERNIZED MACHINES FOR
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Automatic Line for Making Taps of the Diameter of 9 to 16 mm

In accordance with the existing specializations of the tool factories the nomenclature and the ranges of the dimensions of the processed taps on analogous automatic lines, operatable at these factories, are not identical

At the factory Frezer (milling cutter) named for Kalin for the processing of taps of the diameter of 9 to 16 mm there have been constructed two automatic lines, identical as to composition of equipment (with the exception of the automatic lathes). On one of them (Fig. 149, see insert). On one of them there are processed taps of the diameter from 9 to 10 mm, and on the other from 11 to 16 mm.

On each of these automatic lines basically the same operations are performed as on the line for processing taps of the diameter of 7 to 8 mm.

On the automatic lines for processing taps of the diameter of 9 to 10 and 11 to 16 mm there has been introduced an additional operation, the milling of the ends of the blanks of the taps on automatic horizontal milling machines 11 model 680P for the purpose of removing the burr remaining on the face of the blank after its being cut off on the automatic lathe.

The hourly productivity of the automatic lines amounts to: taps of the diameter of 10 mm 1,600, of the diameter of 12 to 14 mm 1,400, and of the diameter of 16 mm 1,200.

The limiting operation on these automatic lines is the rounding off and cutting off of the blanks on the automatic lathes

The automatic line is attended by three machinists (for eight automatic lathes) and four adjusters.

Automatic Line for Making Taps of the diameter of from 18 to 24 mm

On the automatic line (section shown in Fig. 150) the following operations are performed:

- 1) Flushing and checking the lengths of the blanks of the taps on a special checking and sorting automatic machines.
- 2) Milling of the ends of the blanks on the automatic horizontal milling machine Model 680P.
- 3) Centering on the special automatic centering stand.
- 4) Rounding of the posterior and working part on three automatic hydraulic copying lathes Model VT10.
- 5) Through-feed grinding of the working part of the tap to pass under the milling of the cutter on the centerless grinding machine 4, 1, model 3180.
- 6) Preliminary grinding by notching the posterior part on the automatic centerless grinding stand 4, 3, model 3180.
- 7) Milling of the squares of the taps on the automatic horizontal milling machine 5 of the Cincinnati concern.
- 8) Marking on the automatic marking stand 7, model T-34.
- 9) Preparatory (with allowance under grinding) smoothing of the cutter of machine and manual taps with ground profile of the cutter and final smoothing of the cutter of the taps with unground profile on the automatic thread-cutting stand 9 with the round Pee-Wee dies.
- 10) Finish feed-through grinding of the working part of taps with unground profile of the cutter on the automatic centerless grinding stand model 3180 equipped with automatic electrical-impulse counting device for counting the processed parts 11.

11) Milling of shaving grooves on four automatic on four plane-milling machines, Model 6V-1M.

12) Removing of barbs by a mechanical device on a special automatic machine and rounding the parts in the process of working.

The hourly productivity of the automatic line amounts to 500 taps of the diameter of 18 mm.

This line consisting of 17 machines is served by five adjusters.

(GRAPHIC NOT REPRODUCABLE)



Fig. 150. Automatic line for working taps in diameter 18 to 24 mm

1. automatic centerless grinding stand model 3180; 2. chain transporter with overhead drive; 3. automatic centerless grinding stand model 3180; 4. chain transporter with overhead drive; 5. automatic horizontal milling machine of Cincinnati concern; 6. chain transporter with underneath drive; 7. automatic marking stand model T-36; 8. chain transporter with underneath drive; 9. the Pee-Wee automatic thread-cutting machine; 10. inertial transporter; 11. automatic centerless grinding stand model 3180.

3. Basic Industrial-Economic Indices of Automatic Lines of Modern

Universal Machines

The improvement in the quality of the processed parts through stabilization of their geometric parameters and modes of machining on automatic machines proves to be one of the main indices of the industrial-economic effectiveness of the automatic lines described.

The productivity of the stands as depends on the dimensions of the parts being processed and the character of the operations have been improved by a factor of 2 or 3 through the shortening of the auxiliary time in automatic feeding. The systems of machining have remained unchanged and in a number

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of cases has deteriorated.

Increase in the output of production from a unit of production area occupied by automatic lines by a factor of $2\frac{1}{2}$ has been assured through the increased productivity of the machines and improved technological processes as well as the freeing of considerable production area formerly occupied by flow nonautomatic production filled up with belt conveyers.

The productivity of the labor on automatic lines has increased by a factor of 3 to 6 through increasing the productivity of the machines and parallel tending of a number of machines at a time.

The greatest increase in the productivity of the work (by a factor of 9 to 12) was attained as a result of the replacing of the broaching of the squares of the taps by broaching machines, and milling one horizontal milling machines by stamping on automatic crank presses.

The least increase in the productivity of the work (10 to 15%) was assured as a result of the building in of automatic longitudinal shaping lathes in the automatic line and equipping them with feeding devices.

The average norm for tending the automatic lines described consists of three automatic machines for one adjuster and three to four automatic lathes for one machinist. The machinists do the adjusting only for the automatic lathes.

The period for the outlays to repay themselves in automation through the lowering of the cost of production at the factory Frezer named for Kalinin amounts to less than two years with increase in the earnings of the worker of from $1\frac{1}{2}$ to 2 times taking into account the expenditure for preparing experimental specimens and experimental work.

At the Tomsk and Sestroretsk tool factories to which were sent the working drawings of the automatic devices upon correction after trying out the

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experimental specimens the period for the outlays to pay for themselves was less than a year.

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